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Summary

This document sets out the hardware and software requirements for a service laptop from the viewpoint of Dräger Service MT. The aim is to safeguard the viability of the following software applications:

- Service Software Test Programs MT
- Doris
- Computer Based Training (CBT)
- Intranet
- Artus

under the Windows NT 4 + DOS 6.22, Windows 95 and Windows 98 operating systems.

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1.0	29.02.00	Initial version	Schurack
1.1	19.09.00	WIN NT / 95 / 98 COM port settings added, Win 95 / 98 ACPI COM port powersave disable added, PIF file settings added	Schurack
1.2	27.10.00	2.2 Savina Bootstrap Download SW added	Schurack

Applicable Document List

Reference	Title, author, revision, date, status

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1 Introduction

1.1 Scope

This document sets out the necessary hardware and software configuration of a PC on which the Dräger mt Service Software is to be installed. A x86 processor or higher (Pentium, Celeron, Pentium II, Pentium III, AMD K6, etc.) is required.

1.2 Purpose

To safeguard the function capability of the software applications deployed by Dräger Service, such as:

- Service Software Test Programs MT
- Doris
- Computer Based Training (CBT)
- Intranet
- Artus

under the Windows NT4 + DOS 6.22, Windows 95 and Windows 98 operating systems on different hardware platforms.

1.3 Terms

I/O address	Hardware input/output address in hexadecimal format
IRQ	Hardware interrupt signal

2 Hardware

The PC/laptop must conform to the PC98 or PC99 Design Guide (or higher). This Guide was drafted by the Intel Corporation and the Microsoft Corporation in cooperation with the hardware manufacturers, and is intended to ensure optimum interoperability between the hardware and the Microsoft® Windows® operating systems. In addition, the PC/laptop should have one of the following logos issued by Microsoft if the computer passes the relevant test suite:

“Designed for Windows 98”

“Designed for Windows NT and Windows 98”

“Designed for Windows 2000 and Windows NT 4.0”

See <http://www.microsoft.com/windows/compatible/>

2.1 Minimum requirement

The following is the minimum hardware configuration required:

Intel Pentium, Celeron, AMD K6 etc. processor > 200 Mhz
64 MB RAM minimum
2 GB hard disk Memory minimum
LCD display minimum 800 x600 pixels physical resolution, in colour
Graphics card

- >= 65536 colours
- VGA compatible
- under DOS VESA BIOS for resolutions > 640x480

Internal CD-ROM, minimum 8-speed
Floppy disk drive, internal or external
Internal mouse/touchpad PS/2 and external PS2 mouse
Standard sound card
1 free RS232 FIFO port, (COM1 or COM2) 9-pin D-Sub plug
1 free parallel port LPT Port ECP / EPP (LPT1 or LPT2) 25-pin D-Sub socket
2 PCMCIA slots (on laptop computers)

Optionally

Modem for Remote Service min. V34+ 28800 Baud internal or external (PCMCIA on laptop computers)
10/100 Base T network card (PCMCIA on laptop computers)
IRDA interface
DVD ROM drive

2.2 BIOS configuration

At present DOS programs which directly access the COM and LPT ports are still in use. The PC hardware must permit the ports to be configured accordingly to fixed I/O addresses and fixed IRQ interrupts (Legacy ISA).

The hardware must be configured as follows in the BIOS:

RS232 COM ports:

COM1: I/O address = 3F8H

IRQ = 4

COM2: I/O address = 2F8H

IRQ = 3

printer LPT port:

LPT1: I/O address = 378H

IRQ = 7

LPT2: I/O address = 278H

IRQ = 5

Powersave mode:

Powersave mode must be deactivated when the download software, BD32 software, Savina Bootstrap Download and flash software is in use, otherwise the protocol timing may be disturbed to such an extent that the download is aborted.

BATTERY SAVE MODE= User Setting

BATTERY SAVE OPTIONS

Processing Speed = High

CPU Sleep Mode = Disabled

Display Auto Off = Disabled

HDD Auto Off = 60 min

3 Operating system

The Dräger mt Service Software requires a graphical 32-bit operating system. Windows NT 4 or Windows 95/98 may be used. Some of the service programs are still DOS-based programs which for timing reasons require full control over the PC hardware. Consequently, the operating system must be bootable in DOS mode (Win95/98) or it must be possible to install a standalone DOS operating system which can be booted by way of a Boot Manager (Windows NT4).

All operating systems should be installed with the approved Service Releases and Updates, in order to remedy known errors in the operating systems. It may occasionally be necessary to update the BIOS of the PC/laptop prior to installing the operating system.

3.1 Windows NT 4

Windows NT4 is an operating system in which access to the hardware is managed by modules of the operating system. Some of the service programs are still DOS-based programs which for timing reasons require full control over the PC hardware. Consequently, the standalone DOS 6.22 operating system must be installed in addition to Windows NT 4 and be bootable by a Boot Manager, e.g. from Windows NT.

For installation and configuration of DOS 6.22 see 3.2

3.1.1 Hard disk partitioning

Depending on the size of the hard disk, it may need to be divided into two or more partitions. The primary partition must be large enough for the DOS operating system to be installed on it without problem with all options and the Service Software. 100 MB of disk space must be kept free for the Service Software. The primary partition should therefore not be smaller than 200 MB. The expanded partition is then used for the second operating system (NT 4). For CBTs approximately 100 MB of disk space must be kept free on it.

- Primary partition 200 MB, FAT 16 – Disk name DOS with bootable DOS 6.22 operating system
- Secondary/expanded partition rest of hard disk, e.g. NTFS – Disk name NTFS with bootable Windows NT 4 operating system.

3.1.2 Operating system: Installation

- The operating system is installed with the standard or custom setup.
- Windows Messaging must **not** be installed, or must be uninstalled after the standard installation
- Operating system folder: D:\WINNT
- PS2 mouse driver installed
- Sound driver installed
- The network must also be installed with the TCP/IP protocol
- The Dial-up network / RAS Client must also be installed.
- The Dial-up network modem for interconnection of 2 PCs with a serial cable must also be installed

Optionally:

- Internal / external modem
- 10/100 Base T network card

3.1.3 Operating system: Configuration

- The operating system is installed in the standard configuration as by Setup.
- The hardware settings in the Control Panel for the COM ports and the LPT ports must match the BIOS settings.
- The COM port settings must be as follows: 9600 baud, 8 databits, 1 stopbit, no parity and no flowcontrol / protocol.
- No serial mouse or serial printer must be installed on the free serial port. Mouse: Control Panel - Device Manager - "Standard Serial Mouse" - Start mode: Disabled.
- The settings in the Registry for "Lastdrive" must point to drive "Z".
- The drive letter "U" must not be assigned for hard disks, CD-ROMs or network drives. This drive designation must be reserved for the DORIS Filedisk driver.
- Disable the screen saver while the Service Programs are running.
- Disable Powersave functions while the Service Programs are running.
- Disable all Powersave functions of the hardware manufacturer.
- Configure the DOS box (Properties for DOS – Launch of command.com via PIF file is installed by the Service Software).

Memory:

Initial background memory 2048 bytes

All other settings set to "Automatic"

Miscellaneous:

Enable foreground screen saver: "Not selected"

... Windows access keys – Enable only "Alt+Enter"

It must be ensured that the environment variables in the DOS box do not exceed the maximum length permissible for a single variable (255 characters). Otherwise highly unusual malfunctions will occur which are difficult to diagnose. For this reason the Service Programs are launched by way of a PIF batch file combination, in which the special start files confdw.nt and autodw.nt ensure that the DOS box is started with the minimal loaded environment and minimal drivers. Important is also to disable the compatible hardware timer emulation in the PIF file and to place the slider of the background activity setting in the lower forth of the setting range (direction low).

File =%SystemRoot%\system32\confdw.nt (Installed by Service Software):

```
dos=high,umb  
device=%SystemRoot%\system32\himem.sys  
FILES=200
```

File =%SystemRoot%\system32\Autodw.nt (Installed by Service Software):

```
lh %SystemRoot%\system32\dosx  
set path=
```

No Powersave programs must be started !

Service Laptop Hardware Requirements & Configuration**3.1.4 Application programs: Installation**

- The DORIS Filedisk driver must be installed (DORIS CD 2)
- The Acrobat Reader > 4.0 must be installed (DORIS CD 2)
- ServiceSoftware 7901831 > Version 9.2 must be installed (DORIS CD 2 – U:\ ...)
- Navigator > 4.5 as default browser (for Intranet and CBTs)
- For Artus see separate description

Optionally installed under DOS:

- The BD32 software must be installed. Repair download – Motorola processors
- The DL_PC software must be installed. Repair download – Siemens processors
(Julian Flash repair)

Important: When installing additional programs, make sure they only alter the time response of Windows NT to a minor degree. Unpredictable time response can easily occur in connection with programs which run in the background and access the hard disk. Programs of this kind include antivirus scanners, hard disk encryption utilities, defragmenters, hard disk compression utilities, indexing utilities (FindFast from the Office suite), screen savers, etc.

3.2 DOS 6.22 / DOS Mode

A special DOS partition with the separate operating system DOS 6.22 is only required if the operating system normally used cannot be booted in DOS mode (that is, not the DOS box but a separate DOS mode in which a Service Program has full control over the hardware of the PC). At present this applies to Windows NT 4. Consequently, if Windows NT 4 is used as the default operating system a DOS partition with DOS 6.22 must be created.

3.2.1 Hard disk partitioning

See description for Windows NT 4

3.2.2 Operating system: Installation

- The operating system is installed in the standard installation.
- Operating system folder C:\DOS

3.2.3 Operating system: Configuration

- **Config.sys file (minimum):**

```
DEVICE=C:\DOS\HIMEM.SYS /TESTMEM:OFF
DEVICE=C:\DOS\EMM386.EXE noems
DOS=HIGH,UMB
SHELL=C:\DOS\COMMAND.COM /e:2048 /p
COUNTRY=049,850,C:\DOS\COUNTRY.SYS
BUFFERS=50
FILES=100
STACKS=9,256
SWITCHES=/W
LASTDRIVE = Z
```

- **Autoexec.bat file (minimum):**

```
set path=C:\DOS;C:
lh KEYB GR,,C:\DOS\KEYBOARD.SYS>NUL
lh doskey>NUL
rem
rem ----- Global settings -----
rem
set tmp=C:\TMP
set temp=C:\TMP
```

No Powersave programs must be started !

3.2.4 Application programs: Installation

- The Service Software is installed under Windows.
Default folder C:\MT-DS

Optionally:

- The BD32 software must be installed. Repair download – Motorola processors
- The DL_PC software must be installed. Repair download – Siemens processors
(Julian Flash repair)

3.3 Windows 95 OSR2 / 98 Second Edition

Important:

With Windows 98 it must be ensured that the PC hardware is compatible with the operating system. It has in the past occurred (Toshiba 40xx) that the COM ports were no longer available in the DOS box after Windows 98 booted. This error evidently results from the intensive hardware scan which overwrites the BIOS hardware settings with invalid values. If the computer is booted directly in DOS mode after a coldstart, the COM ports work.

3.3.1 Hard disk partitioning

Depending on the size of the hard disk, it should be divided into two or more partitions. The primary partition must be large enough for the operating system to be installed on it without problem with all options and the Service Software. 100 MB of disk space must be kept free for the Service Software. For CBTs approximately 100 MB of disk space must be kept free. The primary partition should therefore not be smaller than 1GB.

- Primary partition \geq 1GB , FAT 16 or FAT 32 – Disk name WINDOWS
- Secondary/expanded partition rest of hard disk, e.g. FAT32 – Disk name FAT32 (may also be omitted)

3.3.2 Operating system: Installation

- The operating system is installed with the standard or custom setup.
- Windows Messaging must **not** be installed, or must be uninstalled after the standard installation
- Operating system folder: C:\WINDOWS
- PS2 mouse driver installed
- Sound driver installed
- The network must also be installed with the TCP/IP protocol
- The Dial-up network / RAS Client must also be installed.
- The Dial-up network modem for interconnection of 2 PCs with a serial cable must also be installed

Optionally:

- Internal / external modem
- 10/100 Base T network card

3.3.3 Operating system: Configuration

- The operating system is installed in the standard configuration as by Setup.
- The hardware settings under Control Panel-System-DeviceManager for the COM ports and the LPT ports must match the BIOS settings.
- The COM port settings must be as follows: 9600 baud, 8 databits, 1 stopbit, no parity and no flowcontrol / protocol.
- No serial mouse or serial printer must be installed on the free serial port.
- If the COM port does not work correctly in the DOS Box it may be necessary to disable the ACPI Power Management Funktion for the COM ports. This can be done only by changing the Windows registry.
"Hkey_Local_Machine\System\CurrentControlSet\Services\VxD\VCMM"
Change the value for the key "EnablePowerManagement" using Windows 95 from 0x00000001 to 0x00000000 and using Windows 98 from „01 00 00 00" to "00 00 00 00". After rebooting the power management funktion for the COM ports are disabled.
- The settings in the Registry for "Lastdrive" must point to drive "Z".
- The drive letter "U" must not be assigned for CD-ROM or network drives. This drive designation must be reserved for the DORIS Filedisk driver.
- Disable the screen saver while the Service Programs are running.
- Disable Powersave functions while the Service Programs are running.
- Disable all Powersave functions of the hardware manufacturer.

Service Laptop Hardware Requirements & Configuration

- Configure the DOS box (Properties for DOS – Launch of command.com via PIF file is installed by the Service Software).

Memory:

Initial background memory 2048 bytes

All other settings set to "Automatic"

Miscellaneous:

Enable foreground screen saver: "Not selected"

... Windows access keys – Enable only "Alt+Enter"

. Important is also to place the slider of the background activity setting in the lower forth of the setting range (direction low).

- Configure DOS mode (DOS mode as reached via the "F8" Start menu after the coldstart)

Config.sys file (minimum):

```
DOS=HIGH,UMB
SHELL=C:\WINDOWS\COMMAND.COM /e:2048 /p
COUNTRY=049,850,C:\WINDOWS\COMMAND\COUNTRY.SYS
BUFFERS=50
FILES=100
LASTDRIVE = Z
```

Autoexec.bat file (minimum):

```
set path=C:\WINDOWS;C:\WINDOWS\COMMAND;C:
lh KEYB GR,,C:\WINDOWS\COMMAND\KEYBOARD.SYS
lh doskey
rem
rem ----- globale Settings -----
rem
set tmp=C:\TMP
set temp=C:\TMP
```

No Powersave programs must be started !

3.3.4 Application programs: Installation

- The DORIS Filedisk driver must be installed (DORIS CD 2)
- The Acrobat Reader > 4.0 must be installed (DORIS CD 2)
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Optionally installed under DOS:

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Important: When installing additional programs, make sure they only alter the time response of Windows to a minor degree. Unpredictable time response can easily occur in connection with programs which run in the background and access the hard disk. Programs of this kind include antivirus scanners, hard disk encryption utilities, defragmenters, hard disk compression utilities, indexing utilities (FindFast from the Office suite), screen savers, etc.